

Application Serial No. 10/537,679

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Listing of Claims:

1. (Previously presented) A method of producing a complex structure wherein respective connecting faces of two structures are brought into contact and assembled, the method comprising applying mechanical forces to each of the two structures before bringing them into contact to curve the two structures and create a tangential stress state difference, wherein the tangential stress state difference causes a predetermined stress state within the complex structure under subsequent processing conditions relative to the assembly conditions.

2. (Previously presented) The method according to claim 1 further comprising deforming one of the two structures before bringing the two structures into contact.

3. (Previously presented) The method according to claim 1 wherein creating a tangential stress state difference comprises generating stresses independently in each basic structure.

4. (Previously presented) The method according to claim 1, wherein the method further comprises curving the two structures so that connecting faces are respectively concave and convex.

5. (Previously presented) The method according to claim 4, wherein curving the two structures comprises curving so that the connecting faces comprise complementary faces.

6. (Previously presented) The method according to claim 5, wherein curving the two structures comprises curving so that the connecting faces respectively comprise spherical concave and spherical convex faces.

7. (Previously presented) The method according to claim 1, wherein applying mechanical forces to each of the two structures comprises creating a pressure difference between connecting faces.

8. (Previously presented) The method according to claim 7, wherein creating a pressure difference between the connecting faces comprises aspirating one of the two structures onto a concave preform having a suitable profile and imparting the profile to a face of the one structure, and wherein the one structure rests on the concave preform at its periphery.

9. (Previously presented) The method according to claim 7, wherein creating the pressure difference between the connecting faces comprises aspirating one of the two structures into a cavity, the one structure resting locally at its periphery on a seal bordering the cavity.

10. (Previously presented) The method according to claim 6 wherein applying mechanical forces comprises deforming one of the two structures between complementary first and second preforms, one of which is concave and the other of which is convex, and imparting selected profiles to the connecting face.

11. (Previously presented) The method according to claim 10, wherein the first complementary preform comprises a concave structure curved to have a selected profile.

12. (Previously presented) The method according to claim 10, wherein the second complementary preform includes aspiration channels for keeping the one structure curved after removing the first complementary preform.

13. (Previously presented) The method according to claim 1, wherein applying mechanical forces comprises applying mechanical forces

simultaneously to the two structures by deforming the two structures between two preforms having selected profiles to be imparted to the connecting faces.

14. (Previously presented) The method according to claim 1, wherein applying mechanical forces comprises applying mechanical forces to at least one of the two structures by means of a preform consisting of a mold.

15. (Previously presented) The method according to claim 14 wherein the preform consists of a porous mold.

16. (Previously presented) The method according to claim 1, wherein applying mechanical forces comprises applying mechanical forces to the two structures using at least one deformable preform.

17. (Previously presented) The method according to claim 1, two structures are assembled by molecular bonding.

18. (Previously presented) The method according to claim 14 further comprising treating the connecting faces to facilitate bonding.

19. (Previously presented) The method according to claim 1 the two structures are assembled by direct contact, wherein the face of at least one of the two structures is adapted to prevent air from being trapped between the connecting faces.

20. (Previously presented) The method according to claim 19 further comprising piercing at least one of the two structures.

21. (Previously presented) The method according to claim 20, wherein piercing at least one of the two structures comprising piercing the structure at its center.

22. (Previously presented) The method according to claim 19 further comprising forming-in that at least one of the two structures at least one dead-end channel discharging at the edge of the structure.

23. (Previously presented) The method according to claim 1, wherein the two structures are assembled by means of a flow layer.

24. (Previously presented) The method according to claim 1, wherein the two structures are assembled at a temperature higher than room temperature.

25. (Previously presented) The method according to claim 24 further comprising heating the two structures by contact with heated preforms.

26. (Previously presented) A method according to claim 25, wherein the preforms are heated to respective different temperatures.

27. (Previously presented) A method according to claim 1 further comprising a technology step including a change of temperature, wherein the tangential stress state difference between the connecting faces is selected so that stresses within the complex structure remain below a predetermined stress threshold.

28. (Previously presented) The method according to claim 27, wherein the technology step is comprises a heat treatment step.

29. (Previously presented) The method according to claim 1 further comprising, after assembling the two structures, a step of thinning one of the two structures to produce a thin film, wherein the tangential stress state difference is selected to impose a predetermined stress level within the thin film.

30. (Previously presented) The method according to claim 29 further comprising assembling the thin film to another structure by creating, prior to assembly, a tangential stress state difference between the connecting faces, wherein tangential stress state difference is selected to obtain within the new assembled structure a predetermined stress state under subsequent processing conditions relative to the assembly conditions.

31. (Previously presented) The method according to claim 1 further comprising producing an epitaxially grown thin film of a material on an external face of the complex structure, wherein the tangential stress state difference is selected so that, at the epitaxy temperature, the external face has a lattice parameter compatible with epitaxial growth of the material.

32. (Previously presented) The method according to claim 31 wherein the structure on which the epitaxially grown thin film is formed is obtained by thinning the structure after assembly.

33. (Previously presented) The method according to claim 31 further comprising the following steps:

- assembling the complex structure including the epitaxially grown film onto another structure via respective connecting faces by creating, a tangential stress state difference between two new faces to be assembled prior to assembly,

- thinning the complex structure to expose a face of the epitaxially grown thin film, and

- epitaxially growing a new material on the exposed face of the thin film,

- wherein the tangential stress state difference between the two new faces is selected so that the lattice parameter of the epitaxially grown thin film is compatible with epitaxial growth of the new material.

34. (Previously presented) The method according to claim 1, wherein the method is carried out in a controlled atmosphere.

35. (Previously presented) The method according to claim 1 wherein the method is carried out in a hydrogen atmosphere.